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AMENDMENT 1
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Road vehicles — Liquefied natural gas (LNG) fuel systems —

Part 1: Safety requirements

AMENDMENT 1

Véhicules routiers — Systèmes à carburant gaz naturel liquéfié (GNL) —

Partie 1: Exigences de sécurité

AMENDEMENT 1

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Foreword

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This document was prepared by Technical Committee ISO/TC 22, *Road Vehicles*, Subcommittee SC 41, *Specific aspects for gaseous fuels*.

A list of all parts in the ISO 19723 series can be found on the ISO website.

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Normative references

Add the following references:

ISO 20653:2013, *Road vehicles — Degrees of protection (IP code) — Protection of electrical equipment against foreign objects, water and access*

ISO 11451-1, *Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 1: General principles and terminology*

ISO 11451-2, *Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 2: Off-vehicle radiation sources*

ISO 11451-4, *Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 4: Bulk current injection (BCI)*

ISO 11452-1, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 1: General principles and terminology*

ISO 11452-2, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 2: Absorber-lined shielded enclosure*

ISO 11452-3, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 3: Transverse electromagnetic (TEM) cell*

ISO 11452-4, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 4: Harness excitation methods*

ISO 11452-5, *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy — Part 5: Stripline*

ISO 7637-1, *Road vehicles — Electrical disturbances from conduction and coupling — Part 1: Definitions and general considerations*

ISO 7637-2, *Road vehicles — Electrical disturbances from conduction and coupling — Part 2: Electrical transient conduction along supply lines only*

Terms and definitions

Add the following term entry after 3.12.

3.13
electronic control unit
ECU
device which controls the *liquefied natural gas* (3.1) demand of the engine and establishes the cut-off of the *automatic valve* (3.11) in case of a broken fuel supply pipe or in case of stalling of the engine, or during a crash

4.1.2.10

Add the following subclause after 4.1.2.9.

4.1.2.10 Electronic control unit

The switching-off delay of the automatic valve after stalling of the engine may not be more than 2 s.

The electronic control unit may be equipped with an automatic ignition advance timing adjuster integrated in the electronic module or separated.

The electronic control unit may be integrated with dummy injectors to permit a correct functioning of the gasoline electronic control unit during liquefied natural gas operation.

The electronic control unit shall be designed to operate at low temperature of -40 °C or -20 °C, as applicable, and at high temperature of 105 °C or 120 °C, as applicable.

The installation of LNG electronic control unit equipment shall comply with relevant electromagnetic compatibility (EMC) requirements according to:

— ISO 11451-1, ISO 11451-2, ISO 11451-4, ISO 11452-1, ISO 11452-2, ISO 11452-3, ISO 11452-4, ISO 11452-5, ISO 7637-1 and ISO 7637-2 or equivalent.

Related to ISO 7637-2, the following requirements shall be followed:

a) Emission of transient conducted disturbances generated by ESAs on 12/24 V supply lines.

Measurement according to ISO 7637-2 on supply lines as well as to other connections of ESAs which may be operationally connected to supply lines for the levels given in Table 1.

Table 1 — Maximum allowed pulse amplitude

	Maximum allowed pulse amplitude for:	
Polarity of pulse amplitude	**vehicles with 12 V systems**	**vehicles with 24 V systems**
Positive	+75 V	+150 V
Negative	−100 V	−450 V

b) Immunity against transient disturbances conducted along 12/24 V supply lines.

Apply the test pulses 1, 2a, 2b, 3a, 3b and 4 according to ISO 7637-2 to the supply lines as well as to other connections of ESAs which may be operationally connected to supply lines with the test levels given in Table 2.

Table 2 — Immunity of ESA

Test impulse number	Immunity test level	Functional status for systems:	
		related to immunity related functions	not related to immunity related functions
1	III	C	D
2a	III	B	D
2b	III	C	D
3a/3b	III	A	D
4	III	B	D

4.1.2.11

Add the following subclause after 4.1.2.10.

4.1.2.11 Electrical connections

The electrical connections inside the boot and passenger's compartment shall comply with protection degree class IP 40 according to ISO 20653.

All other electrical connections shall comply with protection degree class IP 54 according to ISO 20653.

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Price based on 3 pages